

LISTING OF THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in this application. Added text is indicated by underlining, and deleted text is indicated by ~~striketrough~~. Changes are identified by a vertical bar in the margin.

Claims 1-43. (Canceled).

Claim 44. (Currently amended) A reticle used for determining inter-field overlay error of a stage on a projection imaging tool, the reticle comprising:

- a first set of alignment attributes disposed along a first column;
- a second set of alignment attributes that are complementary to the first set of alignment attributes, the second set of alignment attributes disposed along a second column distinct from the first column, wherein the alignment attributes in the first and second sets are aligned in corresponding rows;
- a third set of alignment attributes distributed along a first row between the first and second column; and
- a fourth set of alignment attributes complementary to the third set of attributes, the fourth set of alignment attributes disposed in a second row distinct from the first row, wherein the alignment attributes in the third and fourth sets are aligned in corresponding columns, wherein the second and fourth alignment attributes are complementary to the first and third alignment attributes, respectively, in that exposure of the second and fourth alignment attributes interlock with a previous exposure of the first and third alignment attributes after the stage has been shifted in a desired direction relative to the reticle, wherein offset measurements of the exposed alignment attributes are used to determine a self referenced wafer stage overlay error map.

Claim 45. (Original) A reticle as defined in Claim 44, wherein the reticle has reduced transmission.

Claim 46. (Original) A reticle as defined in Claim 45, further comprising a partially reflecting dielectric coating.

Claim 47. (Original) A reticle as defined in Claim 45, further comprising an attenuated phase shift mask.

Claims 48-49. (Canceled).

Claim 50. (Currently amended) An apparatus for determining inter-field overlay error of a stage on a reticle projection imaging tool, the apparatus comprising:

means for producing a first set of alignment attributes disposed along a first column;

means for producing a second set of alignment attributes that are complementary to the first set of alignment attributes, the second set of alignment attributes disposed along a second column distinct from the first column, wherein the alignment attributes in the first and second sets are aligned in corresponding rows;

means for producing a third set of alignment attributes distributed along a first row between the first and second column; and

means for producing a fourth set of alignment attributes complementary to the third set of attributes, the fourth set of alignment attributes disposed in a second row distinct from the first row, wherein the alignment attributes in the third and fourth sets are aligned in corresponding columns, wherein the second and fourth alignment attributes are complementary to the first and third alignment attributes, respectively, in that an exposure of the second and fourth alignment attributes interlock with a previous exposure of the first and third alignment attributes after the stage has been shifted in a desired direction relative to the reticle, wherein offset measurements of the exposed alignment attributes are used to determine a self referenced wafer stage overlay error map.

Claim 51. (Currently amended) A reticle used for determining inter-field overlay error of a stage on a projection imaging tool, the reticle comprising at least two arrays of alignment attributes such that the arrays of alignment attributes have features complementary to each other and the arrays are offset from each other in distinct directions, wherein the reticle is exposed onto a substrate in a first exposure thereby producing a first reticle pattern, and the reticle is exposed onto the substrate in a second exposure thereby producing a second reticle pattern, wherein the second reticle pattern overlaps the first reticle pattern and is shifted in a desired direction so that at least one row or column of alignment attributes of the first reticle pattern overlays with at least one row or column of complementary attributes of the second reticle pattern, thereby creating an interlocking row or column of completed attributes, such that positional offsets of the alignment attributes in the interlocking row or column of completed attributes determine a self referenced wafer stage overlay distortion and yaw error map.

Claim 52. (Previously presented) A reticle as defined in Claim 51, wherein the reticle has decreased optical transmission from nominal.

Claim 53. (Previously presented) A reticle as defined in Claim 51, further comprising a partially reflecting dielectric coating.

Claim 54. (Previously presented) A reticle as defined in Claim 51, further comprising an attenuating phase shift mask.